GEORGE MASON UNIVERSITY
School of Recreation, Health, and Tourism

KINE 410-001: Exercise Physiology II (3)
Fall 2014

DAY/TIME:	M/W 12:00 – 1:15 pm	LOCATION:	PW 248 Bull Run Hall
PROFESSOR:	Dr. Charles Robison	EMAIL ADDRESS:	crobiso4@gmu.edu
OFFICE LOCATION:	PW 205 Bull Run Hall	PHONE NUMBER:	703-993-7115
OFFICE HOURS:	M/W 1:30pm- 3:00pm or by appointment	FAX NUMBER:	703-993-2025

PREREQUISITES:
BIOL 124, BIOL 125, KINE 300, KINE 310

COURSE CATALOG DESCRIPTION:
Provides study in the advanced theory of exercise physiology. Knowledge related to the physiologic, neuroendocrine, and biochemical changes of the human body associated with both a single bout of exercise and chronic exercise training will be addressed.

COURSE OBJECTIVES:
Upon completion of KINE 410 students should be able to:

1. Discuss the dynamics of the bioenergetic, cardiorespiratory, neuromuscular, and endocrine systems
2. Describe advanced physiologic responses to acute and chronic physical activity
3. Identify common nutritional ergogenic aids, the purported mechanism of action, and any risk and/or benefits

COURSE OVERVIEW:
Material for the course will be drawn from the required textbook and assigned readings of published research. Class lectures will be presented in PowerPoint with handouts posted on Blackboard in advance of class meetings.

ACCREDITATION STANDARDS
This course meets the Commission on Accreditation of Allied Health Education Programs (CAAHEP) requirements and covers the following American College of Sports Medicine's Knowledge-Skills-Abilities (KSA's):

KSA	**Description**	**Lecture, Lab, or both**
	GENERAL POPULATION/CORE: **EXERCISE PHYSIOLOGY AND RELATED EXERCISE SCIENCE**	
1.1.9	Ability to describe the systems for the production of energy.	Lecture
1.1.10	Knowledge of the role of aerobic and anaerobic energy systems in the performance of various physical activities.	Both
1.1.11	Knowledge of the following cardiorespiratory terms: ischemia, angina pectoris, tachycardia, bradycardia, arrhythmia, myocardial infarction, claudication, dyspnea and hyperventilation.	Lecture
1.1.12	Ability to describe normal cardiorespiratory responses to static and dynamic	Both

	exercise in terms of heart rate, stroke volume, cardiac output, blood pressure, and oxygen consumption.	
1.1.13	Knowledge of the heart rate, stroke volume, cardiac output, blood pressure, and oxygen consumption responses to exercise.	Both
1.1.14	Knowledge of the anatomical and physiological adaptations associated with strength training.	Lecture
1.1.16	Knowledge of the common theories of muscle fatigue and delayed onset muscle soreness (DOMS).	Both
1.1.17	Knowledge of the physiological adaptations that occur at rest and during submaximal and maximal exercise following chronic aerobic and anaerobic exercise training.	Lecture
1.1.18	Knowledge of the differences in cardiorespiratory response to acute graded exercise between conditioned and unconditioned individuals.	Lecture
1.1.19	Knowledge of the structure and function of the skeletal muscle fiber.	Lecture
1.1.20	Knowledge of the characteristics of fast and slow twitch muscle fibers.	Lecture
1.1.21	Knowledge of the sliding filament theory of muscle contraction.	Lecture
1.1.22	Knowledge of twitch, summation, and tetanus with respect to muscle contraction.	Lecture
1.1.26	Knowledge of the response of the following variables to acute static and dynamic exercise: heart rate, stroke volume, cardiac output, pulmonary ventilation, tidal volume, respiratory rate, and arteriovenous oxygen difference.	Lecture
1.1.27	Knowledge of blood pressure responses associated with acute exercise, including changes in body position.	Lecture
1.1.29	Knowledge of and ability to describe the physiological adaptations of the pulmonary system that occur at rest and during submaximal and maximal exercise following chronic aerobic and anaerobic training.	Lecture
1.1.30	Knowledge of how each of the following differs from the normal condition: dyspnea, hypoxia, and hyperventilation.	Lecture
	GENERAL POPULATION/CORE EXERCISE PRESCRIPTION AND PROGRAMMING	
1.7.16	Knowledge of special precautions and modifications of exercise programming for participation at altitude, different ambient temperatures, humidity, and environmental pollution.	Lecture
	GENERAL POPULATION/CORE: NUTRITION AND WEIGHT MANAGEMENT	
1.8.1	Knowledge of the role of carbohydrates, fats, and proteins as fuels for aerobic and anaerobic metabolism.	Lecture
1.8.14	Knowledge of common nutritional ergogenic aids, the purported mechanism of action, and any risk and/or benefits (e.g., carbohydrates, protein/amino acids, vitamins, minerals, herbal products, creatine, steroids, caffeine).	Lecture
	GENERAL POPULATION/CORE: SAFETY, INJURY PREVENTION, AND EMERGENCY PROCEDURES	
1.10.6	Knowledge of the effects of temperature, humidity, altitude, and pollution on the physiological response to exercise and the ability to modify the exercise prescription to accommodate for these environmental conditions.	Lecture

NATURE OF COURSE DELIVERY:
This course will be delivered in a face-to-face type of environment. This class will consist of both lecture and laboratory instruction.

REQUIRED READINGS:

McArdle, W.D., Katch, F.I, and Katch, V.L. (2014). *Exercise Physiology: Nutrition, Energy, and Human Performance, 8th* edition. Lippincott, Williams & Wilkins.

EVALUATION:

A. Written Examinations (4) *Exams will be T/F, multiple choice and short answer. (Objectives 1,2)*	45%
B. Lab Reports *Lab reports will be written in response to each lab activity. Specific questions will be given for students to address (Objectives 1,2)*	20%
C. Performance Enhancing Substance Paper *A 5-8 page paper will be written addressing a known or suspected performance enhancing substance (Objective 3)*	20%
D. Performance Enhancing Substance Presentation *A 10-15 minute presentation will be delivered addressing the performance enhancing substance discussed in the paper (Objective 3)*	10%
E. Professionalism *Kinesiology students are expected to behave in a professional manner. Depending upon the setting professionalism may appear different, but typically consists of similar components. For undergraduate Kinesiology students in a classroom setting professionalism generally comprises the following components:* ***Attendance** – Show up on time to class and pay attention. If you cannot attend a class for a legitimate reason please notify the instructor ahead of time. If you have to unexpectedly miss a class due to something out of your control, contact the instructor within 24 hours to notify them what happened and to see if there is anything you need to do to make up your absence.* ***Communication** – When communicating with the instructor and classmates, either face-to-face or via the assigned George Mason University email address, students should address the other person appropriately, use appropriate language and maintain a pleasant demeanor.* ***Participation** – Participate in class discussions and activities. Demonstrate that you have an interest in the subject matter.* ***Responsibility/Accountability** – Professionals take responsibility for their actions and are accountable. This can occur at multiple levels but generally consists of completing assignments on time, submitting work that is of the appropriate quality, honoring commitments and owning up to mistakes.* ***Honesty/Integrity** – Students are expected to be honest with the instructor, classmates and themselves. Professionals keep their word when committing to*	5%

something and act in an ethical manner. ***Self-Improvement/Self-awareness*** *– One should be aware of their strengths/weaknesses and constantly seek to improve. Professionals regularly seek out opportunities to increase their knowledge and improve their current skill set. (Objectives 1,2,3)*	

GRADING SCALE

A = 93.5 – 100	B+ = 87.5 – 89.4	C+ = 77.5 – 79.4	D = 59.5 – 69.4
A- = 89.5 – 93.4	B = 82.5 – 87.4	C = 72.5 – 77.4	F = 0 – 59.4
	B- = 79.5 –82.4	C- = 69.5 – 72.4	

TENTATIVE COURSE SCHEDULE

Week	Topic	Reading/Assignment Due
1	Introduction, Energy	Chapter 5
2	ATP, Phosphagen System, Carbohydrate Metabolism	Chapters 6 & 7
3	Lactate Lab, Carbohydrate Metabolism	Chapters 6 & 7
4	Fat and Protein Metabolism	*Lactate Lab due* Chapters 6 & 7
5	**Exam 1**, The Cardiovascular System	Chapter 15
6	Functional Capacity of the Cardiovascular System, Cardiovascular Lab	Chapter 15& 17
7	Cardiovascular Regulation and Integration	Chapter 16 *Cardiovascular Lab due*
8	Cardiovascular Regulation and Integration , **Exam 2**	Chapter 16
9	Skeletal Muscle and Nerve Structure, Muscle Contraction	Chapters 18 & 19
10	Muscle Fiber Types, Muscle Adaptations	Chapters 19 & 22
11	**Exam 3**, Fatigue	Chapter 25
12	Muscle Fatigue Lab, Muscle Soreness	
13	Recovery from Exercise	*Muscle Fatigue lab due* Chapter 7
14	Recovery from Exercise Lab	
15	**Exam 4**	*Recovery from Exercise Lab due*
Monday, 12/15, 10:30-1:15pm	Performance Enhancing Substance Presentations	*Performance Enhancing Substances paper due*

Note: Faculty reserves the right to alter the schedule as necessary.

Student Expectations

- Students must adhere to the guidelines of the George Mason University Honor Code [See http://oai.gmu.edu/the-mason-honor-code/].
- Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the

beginning of the semester [See http://ods.gmu.edu/].

- Students must follow the university policy for Responsible Use of Computing [See http://universitypolicy.gmu.edu/policies/responible-use-of-computing/].

- Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.

- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.

Campus Resources

- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See http://caps.gmu.edu/].

- The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See http://writingcenter.gmu.edu/].

- For additional information on the College of Education and Human Development, School of Recreation, Health, and Tourism, please visit our website [See http://rht.gmu.edu].

PROFESSIONAL BEHAVIOR: Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT: The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles.

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